

WHAT IS CLAIMED IS:

1. A head suspension assembly comprising:
a suspension portion including a suspension arm;
5 a head portion coupled to the suspension arm including a slider body
having a leading edge, trailing edge and opposed sides and one or
more transducer elements; and
a magnetic bearing element on the slider body or suspension portion to
form a magnetic bearing assembly operable to induce a repulsion
10 force to provide a fly-height for the head portion of the head
suspension assembly.
2. The head suspension assembly of claim 1 wherein the magnetic bearing
element includes at least one bearing magnet.
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3. The head suspension assembly of claim 2 wherein the at least one bearing
magnet includes a permanent magnet.
4. The head suspension assembly of claim 2 wherein the at least one bearing
20 magnet includes an electro-magnet.
5. The head suspension assembly of claim 1 wherein the magnetic bearing
element includes bearing magnets on opposed sides of either a roll axis, a pitch
axis or both, of the slider body.
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6. The head suspension of claim 1 wherein the magnetic bearing element
includes a bearing magnet proximate to a trailing edge of the slider body spaced
from a pitch axis of the slider body.

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7. The head suspension assembly of claim 1 wherein the slider body includes at least one raised bearing surface and at least one recessed bearing surface.
8. The head suspension assembly of claim 1 wherein the transducer element
5 includes a longitudinal recording element.
9. The head suspension assembly of claim 1 wherein the magnetic bearing element includes a conductive element on the slider body or suspension portion.
- 10 10. A bearing assembly for a data storage device comprising:
a head suspension assembly including a suspension portion including a
suspension arm and a head portion including a slider body having a
leading edge, trailing edge and opposed sides and a transducer
portion including a transducer element;
15 a data storage disc having a recording layer; and
a magnetic bearing element on the slider body or suspension portion and a
magnetic bearing element on the data storage disc and the magnetic
bearing elements including a bearing magnet and a conductive
element to provide a repulsion force between the head suspension
20 assembly and the data storage disc to provide a fly height for the
head portion of the head suspension above a disc surface.
11. The bearing assembly of claim 10 wherein the bearing magnet is a
permanent magnet.
- 25 12. The bearing assembly of claim 10 wherein the bearing magnet is an electro-
magnet.

13. The bearing assembly of claim 10 wherein the bearing magnet is formed on the slider body or suspension portion and the disc includes a conductive layer or substrate to form the conductive element.
- 5 14. The bearing assembly of claim 10 wherein the conductive element is formed on the slider body or the suspension portion and the bearing magnet is formed of a magnetic recording layer on the data storage disc.
- 15 15. The bearing assembly of claim 10 wherein the transducer element includes
10 a longitudinal recording element.
16. The bearing assembly of claim 12 including a controller coupled to the electro-magnet to selectively energize the magnetic bearing assembly.
- 15 17. The bearing assembly of claim 10 wherein the recording layer is a magnetic recording layer.
18. A method for reading or writing data relative to a disc comprising steps of:
energizing a magnetic bearing assembly to provide a lifting force to a head;
20 and
rotating the disc to read or write data to the disc.
19. The method of claim 18 wherein the disc is rotated after energizing the magnetic bearing assembly.
- 25 20. The method of claim 18 wherein the magnetic bearing assembly includes an electro-magnet and comprising the step of:
energizing the electro-magnet to dynamically adjust a fly height of the head.

21. A method for reading or writing data relative to a disc comprising steps of:
rotating a disc to create a repulsion force between a magnet and a
conductive element to provide a lifting force to a head; and
5 reading or writing data to the rotating disc.
22. The method of claim 21 and comprising the steps of:
supplying a load force to the head at a load point to define a roll axis; and
providing the repulsion force on opposed sides of the roll axis of the head.
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23. A method for measuring fly height or vibration comprising the steps of:
rotating a disc; and
measuring voltage or current across an inductive coil to measure fly height
or head vibration.
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24. The method of claim 23 and further comprising the step of detecting
asperities or defects on the disc based upon the measured voltage or current
fluctuations.
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